

REMARKS

Reconsideration of the application is requested in view of the modifications above and the remarks below. Applicants have cancelled Claims 1-5 and added the above-mentioned new claims.

A. Rejection Under 35 USC 112, second paragraph

The Office Action rejected Claims 3 and 5 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. With respect to Claim 3, the Office Action alleged that the phrase "as formed to established a dielectric oxide of the alloy at pore walls" is unclear as to whether a dielectric oxide is claimed. In view of the modifications above, the rejection is believed overcome.

The Office Action alleged that the phrase "wgt. ratio of about (Ta,Nb)gSb," was confusing. In view of the modifications above, the rejection is believed overcome.

B. Rejection Under 35 USC 102

1. Rejection of Claims 1-4 Over U.S. Pat. No. 3,825,802 (Kumagai)

The Office Action rejected Claims 1-4 under 35 U.S.C.102(b) as being anticipated by U.S. Pat. No. 3,825,802 (Kumagai). The rejection should be withdrawn in view of the modifications above and the remarks below.

It is well settled that in order for a prior art reference to anticipate claim, the reference must disclose each and every element of claim with sufficient clarity to prove its existence in prior art. The disclosure requirement under 35 USC 102 presupposes knowledge of one skilled in art of claimed invention, but such presumed knowledge does not grant license to read into prior art reference teachings that are not there. See Motorola Inc. v. Interdigital Technology Corp. 43 USPQ2d 1481 (1997 CAFC). It is also well-settled that a 35 USC 102 rejection must rest upon the literal teachings of the reference and that the teachings must disclose every element of the claimed invention in as complete detail as is contained in the claim (See. Jamesbury Corp v. Litton Industrial Products, Inc. 225 USPQ, 253, 256 (CAFC 1985); Kalman v. Kimberly-Clark Corp 218 USPQ 781, 789 (Fed. Cir. 1983)).

Applicants' invention encompassed by the new claims relates to a substrate system comprising a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride powders and (ii) a silicon component, e.g. a silicon powder. The system has a capacitance that is at least 10,000 CV and the silicon is present in an amount that is at least 500 ppm. In one embodiment, Applicants' invention relates to a capacitor comprising a substrate system containing a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride powders and (ii) a silicon component, in which (a) the system has a capacitance that is at least 10,000 CV and (b) the silicon is present in an amount that is at least 500 ppm.

Advantageously, Applicants' invention provides previously unavailable benefits. Figures 2, 5, 6, for instance, show an improvement of bias dependence with heat treatment, thereby implying that that there is a stabilization of the anodic oxide film. Example 1 and Figures 1, 7, and 8 show how the use of silicon can function as a sinter retardant. Advantageously, the silicon acts as a sinter retardant which is demonstrated both by the smaller slope of the CV/g vs. sinter temperature, but also this is reflected in the porosimetry. Applicants' invention resulted in a more open pore structure which resulted from the sinter retardant properties of the silicon powder. This increase in porosity of the sintered pellet should result in lower ESR in the finished capacitor. In Example 2, there was also a leakage drop. Example 3 evidences the Applicants' invention providing an increase in capacitance of the Nb and a decrease in leakage. This is unexpected because niobium is known to those skilled in the art to not have as stable an anodic oxide film as tantalum. This decrease in leakage could also reflect silicon's stabilization properties.

Kumagai does not anticipate Applicants' invention. Kumagai simply lacks sufficient details to disclose a substrate system comprising a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride powders and (ii) a silicon component, as claimed by Applicants. Similarly, Kumagai lacks the details to disclose the other embodiments encompassed by Applicants' invention. Reconsideration is requested.

A principal object of Kumagai was to improve capacitance in tantalum capacitors. Kumagai discloses using very impure, low surface area powders. Importantly, Kumagai does not teach porosity improvement. Kumagai does not provide any meaningful data about silicon dopant levels. Sintering at 1700 – 2100°C, and ends up with 3,000 CV/gm. Such disclosures do not anticipate Applicants' invention. Reconsideration is requested.

The Office Action relied on portions of Kumagai that lack the sufficient details to disclose each and every element of the invention encompassed by the newly added claims with sufficient clarity to prove Applicants' invention existed in the prior art. Applicants request that the USPTO acknowledge the differences that exist between Applicants' invention and the invention disclosed by Kumagai and withdraw the rejection. Reconsideration is requested.

2. Rejection of Claims 1 and 5 Under 35 USC 102 Over U.S. Pat. No. 4,235,629

The Office Action rejected Claims 1 and 5 under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 4,235,629 (Marsh). The invention should be withdrawn in view of the modifications above and the remarks below.

Marsh does not disclose Applicants' invention. A principal object of Marsh was to improve embrittlement in capacitor wires to prevent capacitors from breaking off the lead wires.

Marsh does not disclose a substrate system comprising a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride powders and (ii) a silicon component, in which (a) the system has a capacitance that is at least 10,000 CV and (b) the silicon is present in an amount that is at least 500 ppm. Marsh does not disclose a capacitor comprising a substrate system containing a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride powders and (ii) a silicon component, in which (a) the system has a capacitance that is at least 10,000 CV and (b) the silicon is present in an amount that is at least 500 ppm. Marsh does not disclose the other embodiments of Applicants' invention.

The Office Action's allegation that Marsh discloses inherent features of Applicants' invention is not supported by the facts. It is well settled U.S. law that if an invention is anticipated under inherency, the invention must flow as a necessary conclusion from the prior art, not just a possible one. The fact that the prior art *may* possibly have the same features as the claimed invention will not substantiate a finding of inherency (*In re Oerlich*, 212 USPQ 323, 326 (CCPA 1981)). And if a chemical compound is inherently disclosed in a reference, the USPTO must provide factual and technical grounds for establishing that the claimed invention inherently flows from the teachings of the prior art (*Ex parte Levy* 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int 1990)). It cannot be overemphasized that 35 USC 102(b) only deals with the literal teachings of a reference, not theoretical maybes or unrealized possibilities. The Office Action and Marsh do not have the facts necessary to support that Marsh inherently discloses features of Applicants' invention.

Reconsideration is requested.

3. Rejection of Claim 1 Under 35 USC 102 Over U.S. Pat. No. 4,957, 541

The Office Action alleged that Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 4,957, 541 (Tripp). The rejection should be withdrawn in view of the modifications above and the remarks below.

A principal object of Tripp was to reduce leakage at low formation temperatures where phosphorous doping causes leakage issues. Tripp shows increased capacitance, decreased leakage when combined with phosphorous. Sintering is 1400 – 1600°C, Si is 50 – 500 ppm when added without P. Tripp does not disclose substrate systems or capacitors meeting the limitations of Applicants' claims. Tripp merely discloses powders to effect low D.C. leakage, only when combined with P, and anodized between 40 and 90°C (See Abstract). Such disclosures are insufficient to disclose each and every element of the invention encompassed by the newly added claims with sufficient clarity to prove Applicants' invention existed in the prior art. Reconsideration is requested.

Further, Tripp, like Marsh, does not disclose a substrate system comprising a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride

powders and (ii) a silicon component, in which (a) the system has a capacitance that is at least 10,000 CV and (b) the silicon is present in an amount that is at least 500 ppm. Tripp does not disclose a capacitor comprising a substrate system containing a mixture of (i) a refractory metal component selected from the group consisting of tantalum powders, tantalum nitride powders, niobium powders, niobium nitride powders and (ii) a silicon component, in which (a) the system has a capacitance that is at least 10,000 CV and (b) the silicon is present in an amount that is at least 500 ppm. Marsh does not disclose the other embodiments of Applicants' invention.

Reconsideration is requested.

4. Rejection of Claims 1-4 Under 35 USC 102(b) Over U.S. Pat. No. 4,569,693

The Office Action alleged that Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by 4,569,693 (Albrecht). The rejection should be withdrawn in view of the modifications above and the remarks below.

A principal object of Albrecht was to improve flow and bulk density by the addition of various oxides, silicon being one of them. Albrecht discloses Si at 140 – 935 ppm as oxide additions. These are added as oxides immediately prior to pellet densification and sintering. These are also added as finely dispersed colloids, which have the known effect of improving flow, and the one the inventors rightfully claim. Albrecht does not disclose powders having the elements now required by Applicants' invention. As with the other references cited in the Office Action, Albrecht does not disclose each and every element of claim with sufficient clarity to prove its existence in prior art. The literal teachings of Albrecht do not disclose every element of the claimed invention in as complete detail as is contained in the newly added claims. Reconsideration is requested.

5. Rejection of Claims 1-5 Under 35 USC 102 Over U.S. Pat. No. 4,229,297

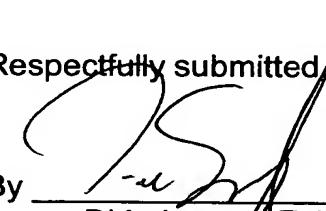
The Office Action rejected Claims 1-5 Under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 4,229,297 (Hahn). The rejection should be withdrawn in view of the modifications above and the remarks below.

A principal object of Hahn was to add inorganic lubricants to improve die life in tantalum pressing for capacitors. Baseline capacitance is low at 8,500 CV/gm. Sinter temperature was 1600°C. Data (Table 3) shows increased capacitance, reduced leakage, but increased ESR. No data showing improved porosity and temperature stability of capacitance is noted. Net Si added (as Si₃N₄) was 780 ppm. Hahn discloses the range of approximately from 60 to 60,000 ppm. This can only apply for nitrides of silicon, since they are lubricious.

Hahn does not disclose a substrate system as encompassed by Applicants' invention. Hahn does not disclose a capacitor comprising a substrate system, as required by Applicants' invention. Hahn does not disclose the other embodiments of Applicants' invention.

In summary, Applicants request that the U.S.P.T.O acknowledge the difference that exists between the invention encompassed by the newly added claims and withdraw the rejection.

In view of the foregoing amendments and remarks, allowance of the pending claims is earnestly requested.

Respectfully submitted,

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